Evidence is also presented that such plants as *Pteris aquilina* and *Pinus* often succeed in competition owing to their dead foliage excluding the light from their competitors, causing etiolation and decay.

In a more recent paper FARROW[23] has examined the retrogression begun by rabbits and continued by sand blasts. This retrogression shows exactly the reverse order of the succession inaugurated by irrigation, being particularly noticeable in the *Agrostis vulgaris* giving place to *Festuca ovina* wherever the sand blast became intensive. Once begun, bare areas tend to increase, the sand assisting in destroying the vegetation both by direct attack and by removing the substratum, leaving clumps of grass upon the tops of small hummocks which are being constantly undermined. With the checking of wind erosion in such bare areas *Polytrichum* and *Cladonia* become agents of stabilization and revegetation.—GEO. D. FULLER.

Photosynthesis.—OSTERHOUT and HAAS[24] summarize as follows a piece of work on the dynamics of photosynthesis. "*Ulva* which has been kept in the dark begins photosynthesis as soon as it is exposed to sunlight. The rate of photosynthesis steadily increases until a constant speed is attained. This may be explained by assuming that sunlight decomposes a substance whose products catalyze photosynthesis or enter directly into the reaction. Quantitative theories are developed to account for the facts." The rate of photosynthesis was determined by the rate at which a portion of *Ulva* rendered sea water basic to phenolphthalein. Since the dissociation of carbonic acid is very slight, change of reaction is a very crude way of measuring the amount present. There is also the possibility of other exchanges of more strongly dissociating materials that could modify the reaction of the water. In the face of excellent and very accurate methods for the quantitative determination of carbon dioxide it seems hardly justifiable to use this questionable method for a study of either respiration or photosynthesis. It is also doubtful whether sufficient regard has been given to other possible limiting factors of the rate of photosynthesis in these experiments. If, in spite of the defects of experimentation, the general conclusion proves true, it is a contribution of great significance and aids in confirming WILLSTÄTTER'S view that the presence of a catalyzer is a common internal limiting factor to the rate of photosynthesis.—WM. CROCKER.

Organic plant poisons.—BRENCHLEY[25] finds hydrocyanic acid very toxic to pea and barley seedlings in water cultures. Hydrocyanic acid in concentrations of 1 part to 100,000 proved rather quickly fatal for peas and somewhat

[23] FARROW, E. P., On the ecology of the vegetation of Breckland. V. Characteristic bare areas and sand hummocks. Jour. Ecology **6**:144–152. 1918.

[24] OSTERHOUT, W. J. V., and HAAS, A. R. C., Dynamical aspects of photosynthesis. Proc. Nat. Acad. Sci. **4**:85–91. 1918.

[25] BRENCHLEY, WINIFRED E., Organic plant poisons. I. Hydrocyanic acid. Ann. Botany **31**:447–456. 1917.

less toxic for barley. Dilutions as great as 1 part to 4,000,000 to 10,000,000 proved somewhat toxic. Hydrocyanic acid showed no stimulation and the cyanogen radicle is the toxic agent.

BRENCHLEY[26] has also studied the effect of various phenols (phenol o-cresol, m-cresol, p-cresol, resorcinol, pyrocatechol, pyrogallol, phloroglucin, orcinol) upon the growth (as indicated by increased dry weight) of barley and peas in water cultures. The purpose was to learn the direct effects of these phenols on the plants, so that it could be considered in using the phenols as partial soil sterilizers. The following concentrations were used: $M/100$, $M/100\times 1/5$, $M/100\times 1/5^2$, and $M/100\times 1/6^2$. The general physiological effect was the same for all the phenols, but the concentration at which these effects showed varied considerably with the different members. The highest concentration was quickly fatal with all the phenols, and the next to highest concentration with o-cresol, pyrocatechol, and pyrogallol, but there was a slight recovery in the others. The lowest concentration showed no injury in any. None of the solutions showed any stimulus effect in any concentrations.—WM. CROCKER.

Regeneration in Phegopteris.—Miss BROWN[27] has recorded the results of some experiments on regeneration in *Phegopteris polypodioides*. Near the base of the petiole of a detached leaf regeneration took place in contact with sand moistened with Knop's solution in moist air. A prothallium-like growth appeared, and from this were developed rhizoids, structures intermediate between leaves and prothallia, and true leaves. The possible determining factors are enumerated, and among them the separation of the leaf from the parent body was evidently necessary; at least it seems evident that "some phase of nutrition must be an important factor in regeneration, if not the most important factor."—J. M. C.

Selaginella.—VAN ESELTINE[28] has begun a series of contributions dealing with the American species of *Selaginella* allied to *S. rupestris*. The group is in need of critical revision, and the results will be of interest to the morphologist as well as the taxonomist. The first paper deals with the representatives of the group occurring in the Gulf Coastal Plain and the territory immediately adjacent to the northeast. In this region 8 such species are recognized, 2 of which are described as new, and an additional one was described by the same author recently. The numerous drawings and photographic plates supplement well the full descriptions.—J. M. C.

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[26] BRENCHLEY, WINIFRED E., Organic plant poisons. II. Phenols. Ann. Botany **32**:259–278. 1918.

[27] BROWN, ELIZABETH W., Regeneration in *Phegopteris polypodioides*. Bull. Torr. Bot. Club **45**:391–397. *figs. 3.* 1918.

[28] VAN ESELTINE, G. P., The allies of *Selaginella rupestris* in the southeastern United States. Contrib. U.S. Nat. Herb. **20**:159–172. *pls. 15–22. figs. 63–70.* 1918.